Insights into retroviral inhibition by restriction factors

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Abstract

The host has developed sophisticated mechanisms that interfere with virus replication as a result of its coevolution with viral parasites. Viruses have, on the other hand, evolved countermeasures to elude such antiviral barriers in order to adapt to its natural host environment. Recently, restriction factors, SERINC3 & SERINC5 were identified that define the ability of Nef to enhance infectivity of HIV-1. Primate lentiviruses & gammaretrovirues were found to encode regulatory proteins which counteract the restriction. The restriction activity is associated with incorporation of SERINC3/5 into retrovirus particles and this then inhibits an early stage of the infection, preceding reverse transcription. When retrovirus producer cells express Nef or Nef-like factor, SERINC3/5, otherwise predominantly localized at the cell surface, is targeted to endosomal compartments and fails to incorporate into virions. While SERINC3 & SERINC5 are reported as major paralogs with anti-retroviral activity, others remain to be evaluated for the antiviral functions.

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